FIELDIANA · ZOOLOGY

Published by

CHICAGO NATURAL HISTORY MUSEUM

Volume 44 | October 25, 1961 | No. 1

A New Fossil Feather-Wing Beetle from Baltic Amber

(Coleoptera: Ptiliidae)

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INTRODUCTION

An amber nodule containing a minute new fossil feather-wing beetle was recently collected on the shore of the Baltic Sea in Latvia by Mikelis Geistauts. The new species belongs to the genus *Microptilium* Matth., which is represented today by two nominal species occurring in Europe.

Only two species of fossil Ptiliidae have been described previously. *Ptilium tertiarium* Horion (*in* Statz and Horion, 1937) was found in a brown coal deposit of Oligocene age in Germany. It was preserved in an extremely fine-grained, yellow, siliceous shale, a few centimeters thick, that was associated with the coal. The other species, *Ptinella oligocoenica* Parsons (1939), is from Baltic amber (Oligocene). Both genera are found in Europe today.

A third fossil that has been assigned to the family is *Microcantharis minutus* Zalessky (1915), discovered in Permian coal of the Kousnetzk Basin. It was described as being 20 micra in length, which is less than one fifteenth as long as the smallest ptiliid beetle known. Tillyard (1924) observed that "Neither in the excellent photomicrographs (X900) nor in the description of this specimen can I find anything which proves it to be even an insect, much less a beetle, and I do not think further notice need be taken of it."

Other fossil Ptiliidae from Baltic amber have been recorded but not described. Helm (1896) referred to several specimens in his collection. Handlirsch (1906, p. 1182) noted that four species were known from amber, probably referring at least in part to Helm's material. Klebs (1911) listed two specimens in his collection, belonging, on the authority of Edmund Reitter, to *Ptenidium* and to

Library of Congress Catalog Card Number: 61–18272

an undescribed genus. The Helm material went to the Staatliche Museum für Naturkunde in Danzig (Horn and Kahle, 1935) and the Klebs amber collection to the Geologische-paleontologische Institut in Königsberg (Brues, 1933). There have been reports of the destruction or dissipation of these collections during World War II (e.g., Ley, 1951, p. 42), and Petrunkevitch (1953) was unable to obtain any information about their present status. Later, however, Martynova (1961) stated taat "the largest collection of insect-containing ambers (Koenigsberg University) did not perish during the Second World War and is now preserved in Berlin."

Recently a fossil feather-wing beetle has been found in Mexican amber of Miocene age. The specimen is in the collection of the University of California and has not yet been studied. It represents a genus of pterycine stock similar to contemporary forms in the Neotropics and different from the known Baltic amber genera.

Ptiliidae may be relatively well represented in amber, though their small size makes them easily overlooked. The structure of the wings suggests that feather-wing beetles disperse by relatively passive flotation in the air. A productive method of sampling contemporary Ptiliidae is to wave a fine mesh net in the air, particularly after rains or in the late afternoon when the relative humidity rises. A collection of this kind made recently in southern Illinois contained 406 Ptiliidae of 13 species. Passive flotation would seem to subject Ptiliidae to entrapment in oozing resins on tree trunks. Brues (1933) compared the relative abundance of families of insects preserved in amber with those trapped on sticky surfaces that he set out in a contemporary forest in New England. No Ptiliidae were recovered in his study, but Brues' methods can not now be evaluated. It may be that factors such as humidity levels during the experiment influenced the results. These beetles are extremely small, mostly well below 1 mm. in length, and the fact that the reported finds in amber already represent at least six genera suggests that Ptiliidae are prone to entrapment in tree resins, and ultimately to preservation in amber.

The piece of amber containing the new ptiliid was partly ground and polished when received. The beetle is near one edge, lying at an angle to the partly planed surface. The surface of the amber is checked and there are fractures intersecting the beetle at several points; thus it is inadvisable to subject the piece to further preparation. For study, a drop of clear immersion oil was placed over the area of the specimen and over this a cover-slip. The study was made chiefly with a binocular dissecting microscope with magnifications up

to 216X and with vertical built-in illumination supplemented by lateral illumination of varying intensity and angle of incidence (see Petrunkevitch, 1942, for methods of study of specimens in amber). The specimen is partly obscured by a white emulsion and by fractures in the amber. A thin film of air that obscured some of the surface of the beetle gradually disappeared during the study. It was probably replaced by immersion oil through some fine fracture that reached the surface of the amber.

The whole-mount illustrations are based on camera lucida drawings and represent interpretations of structures as seen from several

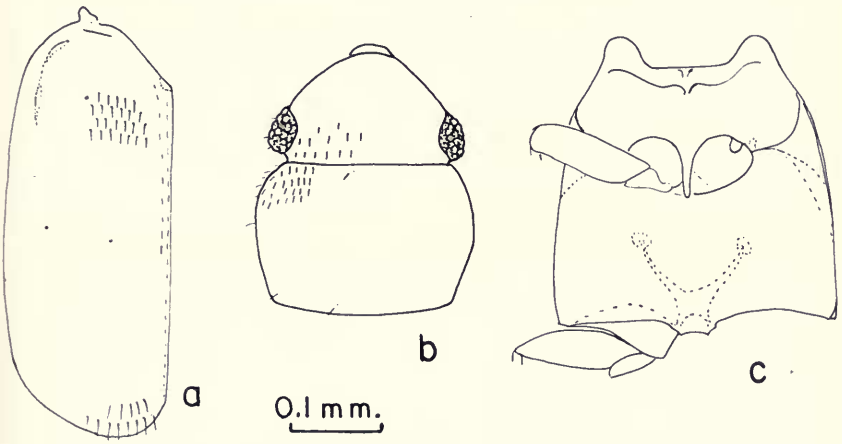

FIG. 1. *Microptilium pulchellum* Allib. *a*, Elytron. *b*, Head and pronotum, dorsal view. *c*, Meso- and metasternum.

angles and under a variety of lighting conditions. The antennae, because of their position and the distortions in the amber, have been drawn free-hand and similarly represent a composite interpretation.

The photographs were made by my colleague, Rupert L. Wenzel, with the aid of a Leitz Ultropak Incidental Light Illuminator (see Wenzel, 1958).

MICROPTILIUM Matth.

Type species.—Microptilium pulchellum Allib. (by monotypy).

The genus *Microptilium* is not well characterized in the literature. It is represented by two living nominal species found in Europe, *M. pulchellum* Allib. and *M. palustre* Kuntzen (1914). The following descriptive notes are based upon two females that are mounted

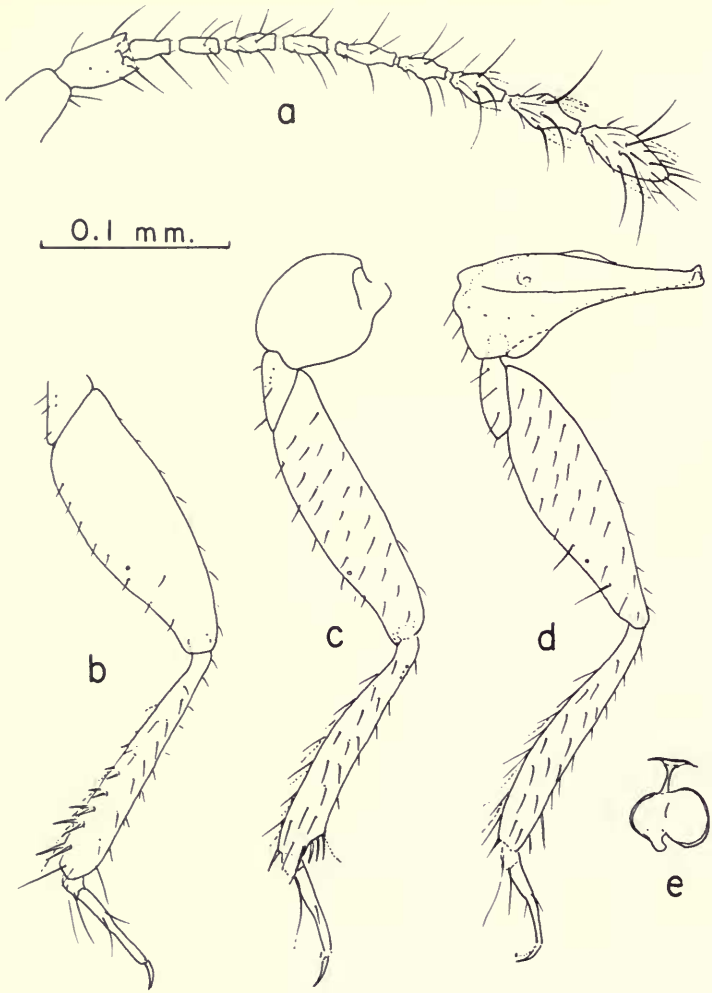

FIG. 2. *Microptilium pulchellum* Allib. *a*, Antenna. *b*, Left anterior leg, anterior face (tibia slightly rotated and not completely flat). *c*, Left middle leg, anterior face. *d*, Left posterior leg, anterior face. *e*, Spermatheca of female.

on microscope slides and bear the label "Neusiedler See, Hung. oc." They were labeled *Microptilium pulchellum* Allib.

Microptilium pulchellum Allib. Figures 1, 2.

Description.—Form elongate, parallel-sided, dorsum somewhat flattened. Antennae (fig. 2, *a*) long, reaching beyond the middle of pronotum, 11-segmented, middle segments long, segment 10 vase-shaped. Mentum trapezoidal; labrum with

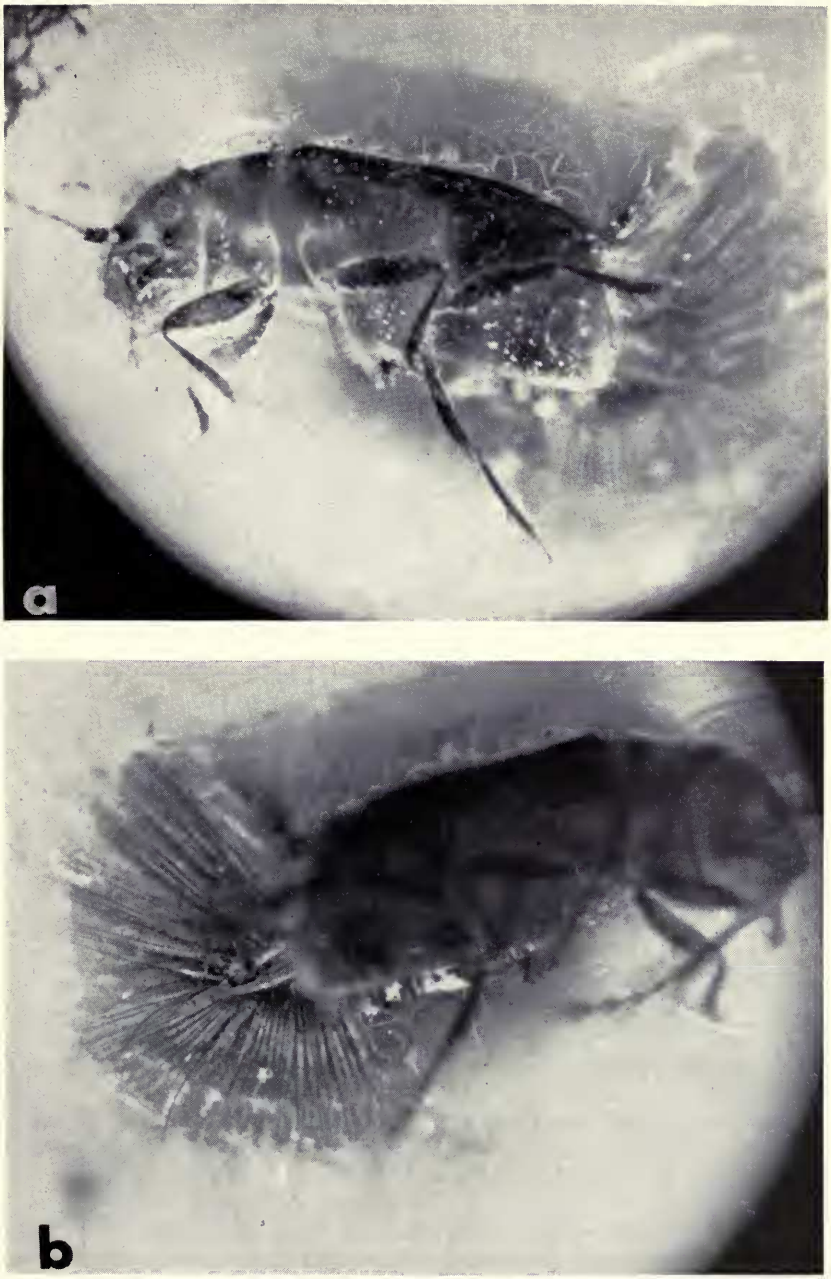

FIG. 3. *Microptilium geistautsi*, new sp. *a*, Whole specimen in amber. *b*, Apex of projecting wing in focus. (Photographs by R. L. Wenzel.)

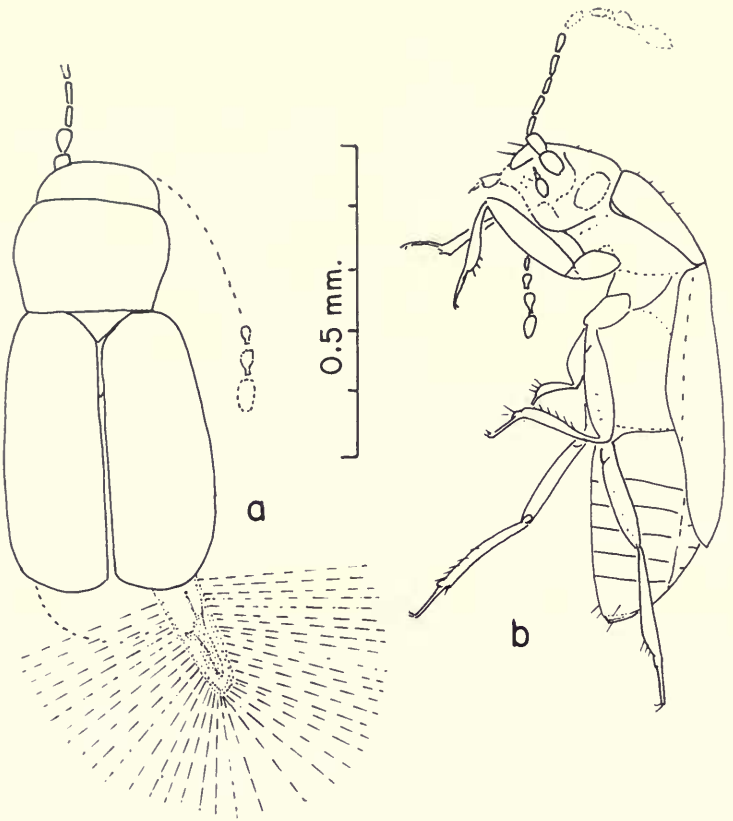

FIG. 4. *Microptilium geistautsi*, new sp. *a*, Dorsal view (marginal hairs of wing only roughly indicated). *b*, Lateral view.

two spines at apex; transverse bar of tentorium with an anteriorly directed spur at middle. Maxillary palpi four-segmented; the terminal segment with the basal half bulbously swollen on one side, its apex awl-shaped; penultimate segment with a small, compoundly papillate structure inserted on apex near insertion of terminal palpal segment.

Pronotum a little wider than head (fig. 1, *b*), wider than long, sides curved, narrowed to the obtuse basal angles. Scutellum rather small, triangular. Elytra long, twice as long as pronotum, subtruncate at apices (fig. 1, *a*). Wings normally developed.

Prosternum a little shorter in front of coxae than least diameter of coxal acetabulum. Mesosternum (fig. 1, *c*) slightly tumid between coxae. Mesopleural-metasternal suture arcuate, bending anteriorly. Metasternum about twice as broad as long, extending between hind coxae, which are separated by about one-seventh of the metasternal width. Abdomen not completely covered by elytra, the terminal dorsal segments (IX and X) separate; pygidium (tergum X) small

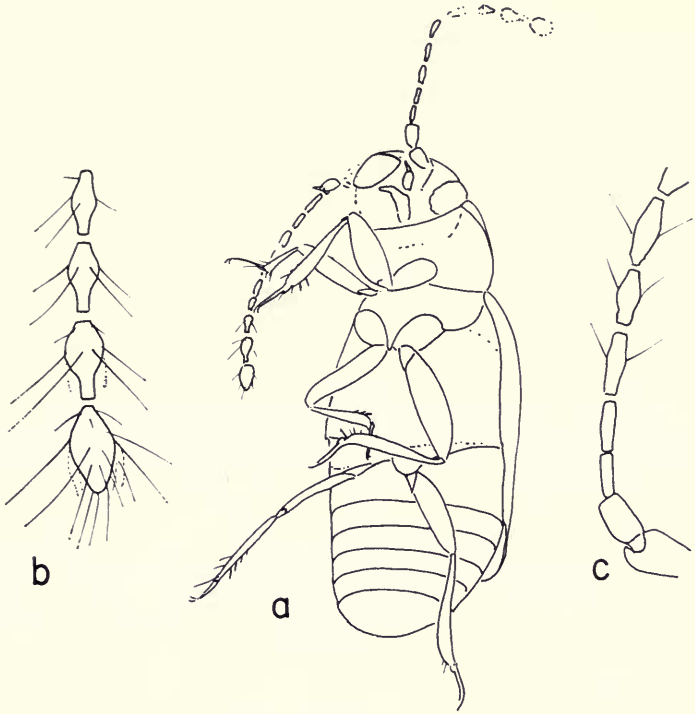

FIG. 5. *Microptilium geistautsi*, new sp. *a*, Oblique view. *b*, Terminal segments of right antenna (free-hand illustration). *c*, Basal portion of left antenna (free-hand illustration).

and without teeth. Tergum VII with micro-pectinate posterior margin. Six visible ventral segments, the first (sternum III) twice as long as each of the following segments, with a median elevation that is expanded anteriorly and that fits between the hind coxae. Internal to the terminal ventral abdominal segment (sternum VIII) is a narrow sclerite bearing 2 small, widely separated teeth, apparently the greatly reduced sternum IX.

Legs moderately slender (fig. 2, *b–d*); tarsi long, slender, the tarsal claws slender, equal, with a small clubbed seta between; posterior coxae scarcely laminate, continued narrowly to the sides of the body; femora not laminate.

Spermatheca (fig. 2, *e*) small, heavily sclerotized.

Remarks.—The genus is distinctive but its natural relationships to other genera of Ptiliidae can not be satisfactorily determined because of the inadequate state of the classification in the family, and because no males were available for study.

The terminal dorsal segments of the abdomen (terga IX and X) are not fused together and the elytra are subtruncate. These char-

acters would exclude *Microptilium* from the *Acrotrichis* group and possibly place the genus in the pterycine group of genera (*Pteryx-Ptinella* and allied genera) but its relationships to other genera in that group are not clear at present.

Microptilium geistautsi, new species. Figures 3–5.

Color deep black, anterior legs brownish, antennae and maxillary palpi yellow. Dorsum rather sparsely clothed with pale, short, curved setae. Antennae as in figure 5, *b*, *c*, differing from those of *M. pulchellum* (fig. 2, *a*) in that segment 9 is conspicuously more vasiform, with the apical portion more slender, and segments 3 and 4 are distinctly longer and narrower.

Length, 0.8 mm.

Holotype.—A specimen of undetermined sex, from Baltic amber collected on the shore of the Baltic Sea in Latvia by Mikelis Geistauts and received from him in May, 1960. In the collection of Chicago Natural History Museum.

Remarks.—The new species is named for Mikelis Geistauts, who collected the specimen and prepared it for study.

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